

Trend Study 5-8-01

Study site name: Barnard Creek.

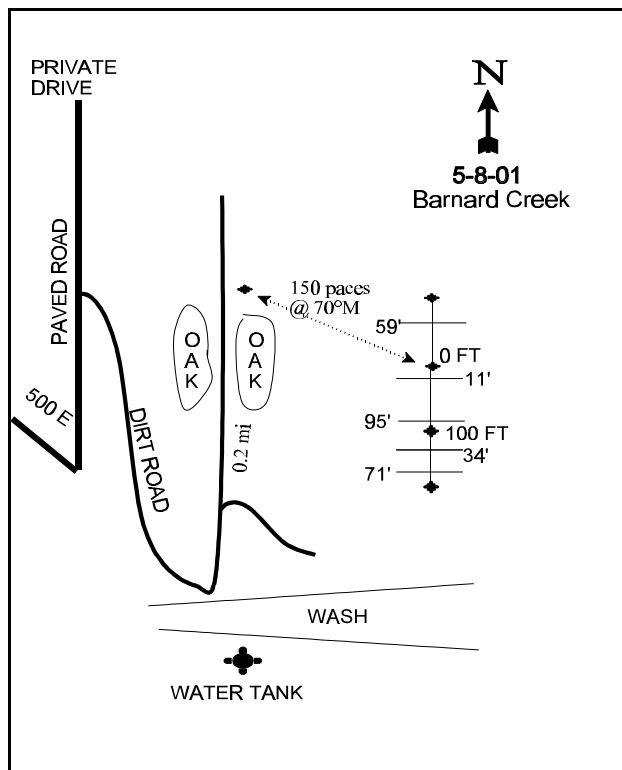
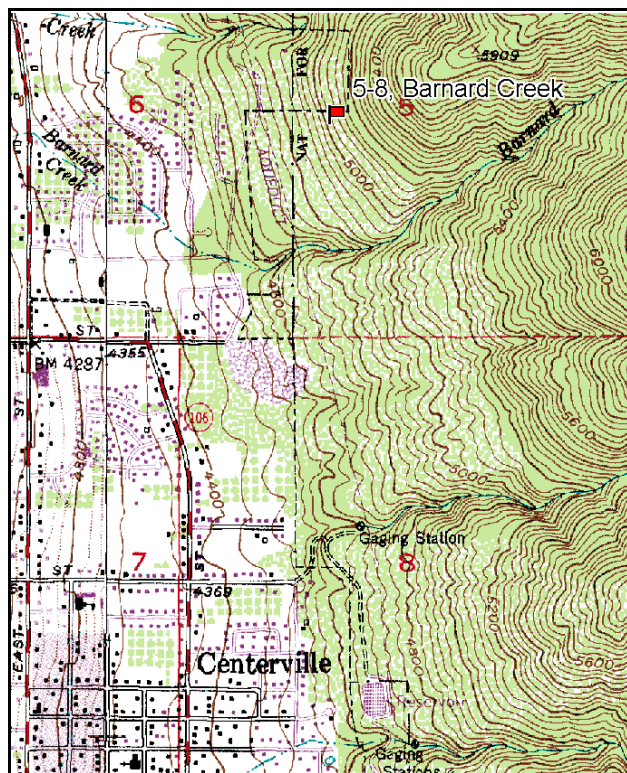
Vegetation type: Bitterbrush.

Compass bearing: frequency baseline 166 degrees magnetic.

Frequency belt placement: Line 1 (11 & 95ft), line 2 (34 & 71ft), line 3 (59ft).

LOCATION DESCRIPTION

From U-106 in Centerville (400 East) take Barnard Street (1200 North) east to Oak Ridge Drive. Turn left on Oak Ridge to 500 East and stop. Take a bearing of 53 degrees magnetic from the northwest corner of this intersection to locate the transect up the first hill below a band of oak and boulders. Continue along Oak Ridge Drive for 0.2 miles, take a hairpin turn to the right and go 0.2 miles along the Weber Basin Pipeline to a fork in the road. Take the left fork and go 0.2 miles around a bend to a fork. Continue left on a two track 0.2 miles to a witness post on the right just after a patch of oak. The transect is 150 paces up the slope at a bearing of 70 degrees magnetic. The 0-foot baseline has browse tag #58 attached. The baseline runs 166 degrees magnetic. The 300 foot line runs off the 0-foot baseline stake at a bearing of 360 degrees magnetic.



Map Name: Bountiful Peak

Diagrammatic Sketch

Township 2N, Range 1E, Section 5

UTM 4531803 N 427123 E

DISCUSSION

Trend Study No. 5-8

The Barnard Creek study is located on critical deer winter range on the Wasatch Face above Centerville. It samples an isolated bitterbrush population on a steep, west facing slope at an elevation of 5,000 feet. The transect is about 1,000 feet from the nearest residence. The transect is located on private land near the National Forest Service boundary. Deer use is heavy and the range has shown some signs of intense utilization during past readings. Some elk also appear to winter on this slope. A pellet group transect read on the site in 2001, estimated 46 deer and 5 elk days use/acre (114 ddu/ha and 12 edu/ha).

The soil is moderately deep and gravely with an effective rooting depth of over 33 inches. It has a deep layer of litter and organic matter built up under the shrubs. The soil has a sandy loam texture with a neutral soil reaction (7.0 pH). Average soil temperature at about 18 inches is only 53° F. Phosphorous is low at only 5.7 ppm. This could be a limiting factor as values less than 10 ppm can limit plant growth and development. The soil is easily disturbed and erosion potential is high. Vegetation and litter cover are high and help limit most erosion. The erosion condition class was determined as stable in 2001. There is easy access for ORVs and their frequent use has led to increased erosion and possibly harassment of wintering big game animals.

Antelope bitterbrush and mountain big sagebrush are the key species on the study area. Bitterbrush is the dominant browse species, providing 83% of the browse cover in 1996 and 76% in 2001. The bitterbrush plants are large and vigorous with an average height of nearly 4 feet and a crown of about 6 feet. Although many are partly decadent, there is good annual leader growth which averaged 2.3 inches in 2001. These plants were heavily hedged in 1985 and most show moderate hedging since then. No reproduction of the bitterbrush is apparent but is not critical at this time for they are long-lived and in good vigor. They can also reproduce by layering. Mountain big sagebrush is of secondary importance. It has been only lightly hedged and exhibits good vigor. However, reproduction has been poor since 1990.

The herbaceous understory is totally dominated by cheatgrass which provided 97% of the total grass cover and 86% of the total herbaceous cover in 1996. During the 2000 reading, cheatgrass produced 93% of the grass cover and 78% of the total herbaceous cover. Average cover of cheatgrass is high averaging over 30%, which creates a substantial fire hazard. The density of perennial grasses is extremely low. Perennial grasses presently include bluebunch wheatgrass, purple threeawn, Sandberg bluegrass, and sand dropseed. A variety of forbs can be found, but they are not abundant. Common species include Pale alyssum, storksbill, hairy goldaster, Douglas knotweed, and Louisiana sage. There is a general lack of herbaceous forage which would be important to deer in the spring.

1985 APPARENT TREND ASSESSMENT

The vegetative trend appears stable to slowly downward. Most of the key browse species are old, but very vigorous. It would be desirable to see more reproduction among the key browse species. An increase in perennial herbaceous vegetation is also desirable, but unlikely to occur because of the erosion problem. The soil condition will continue to decline, especially in the face of increasing ORV use.

1990 TREND ASSESSMENT

Contrary to the downward trends indicated for the low density browse component on this foothill winter range study, the mountain big sagebrush and bitterbrush populations appear relatively stable. An increased density of the moderately hedged, vigorous bitterbrush was found, including several young plants. Mountain big sagebrush has continued to decline in density, but 54% of the population were classified as young plants.

Sagebrush canopy cover in the oak brush openings is about 2%. The understory is dominated by cheatgrass and storksbill. Perennial grasses and forbs remain uncommon or scarce. Good ground cover helps limit erosion.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly and in very poor condition (2)

1996 TREND ASSESSMENT

Although the soil on this site is highly erodible, there is little evidence of recent erosion. Vegetative and litter cover are adequate at this time to hold the soil in place, except in extreme cases. With percent bare ground, rock, and pavement cover decreasing, soil trend is slightly upward. The key browse species are antelope bitterbrush which makes up 83% of the browse cover and mountain big sagebrush which contributes 16% of the browse cover. Bitterbrush utilization is light to moderate with apparently good vigor. There were no seedlings or young found but percent decadence is low at only 3%. The browse trend is stable. The herbaceous understory is sparse with the exception of cheatgrass. Cheatgrass provides much of the vegetative cover, consequently also much of the litter cover. Fire potential is very high on this site with abundant fine fuels to carry the fire. Herbaceous understory trend is stable, but in poor condition because of the high proportion of weedy species.

TREND ASSESSMENT

soil - slightly upward (4)

browse - stable (3)

herbaceous understory - stable, but very poor (3)

2001 TREND ASSESSMENT

Trend for soil is stable. Average cover of bare ground increased slightly while litter cover declined. However, vegetation cover increased and there is ample protective ground cover to prevent most erosion. In addition, the erosion condition class was determined as stable. Trend for the key browse species, antelope bitterbrush, is stable. Utilization is moderate to heavy but vigor is normal and percent decadence low. Trend for the herbaceous understory is up slightly. Sum of nested frequency for perennial grasses and forbs has increased and the nested frequency of annual cheatgrass has declined significantly. The herbaceous understory is still in very poor condition however. Perennial grasses and forbs are still limited and cheatgrass still dominates the site by providing 78% of the total herbaceous cover. Cheatgrass has an average cover value of 31% which creates a substantial fire hazard. A fire in this area would totally eliminate bitterbrush and sagebrush and leave the area totally useless as big game winter range.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up slightly but still dominated by cheatgrass (4)

HERBACEOUS TRENDS --

Herd unit 05 , Study no: 8

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'85	'90	'96	'01	'85	'90	'96	'01	'96	'01
G	Agropyron spicatum	8	3	15	14	3	2	7	9	.67	.90
G	Aristida purpurea	-	2	5	9	-	1	3	4	.09	.36
G	Bromus tectorum (a)	-	-	_b 392	_a 378	-	-	100	100	36.54	30.96
G	Festuca myuros (a)	-	-	-	5	-	-	-	2	-	.03
G	Poa bulbosa	_a 3	_a -	_a -	_b 18	1	-	-	9	-	.20
G	Poa fendleriana	3	3	-	-	2	1	-	-	-	-
G	Poa secunda	_a -	_a -	_b 12	_c 32	-	-	7	14	.10	.66
G	Sporobolus cryptandrus	_a -	_{ab} 12	_{ab} 4	_b 8	-	4	2	5	.30	.27
G	Stipa comata	-	2	-	-	-	1	-	-	-	-
Total for Annual Grasses		0	0	392	383	0	0	100	102	36.54	30.99
Total for Perennial Grasses		14	22	36	81	6	9	19	41	1.16	2.40
Total for Grasses		14	22	428	464	6	9	119	143	37.70	33.39
F	Agoseris glauca	-	-	-	1	-	-	-	1	-	.03
F	Alyssum alyssoides (a)	-	-	_b 29	_a 8	-	-	12	3	.10	.06
F	Allium spp.	_b 11	_a -	_a 2	_c 52	6	-	1	26	.00	.38
F	Ambrosia psilostachya	-	-	9	1	-	-	4	1	.27	.00
F	Artemisia ludoviciana	_b 49	_a 21	_a 11	_a 11	15	10	5	4	.36	.33
F	Aster chilensis	_c 63	_a -	_a -	_b 8	29	-	-	6	-	.03
F	Chenopodium album (a)	-	6	-	-	-	3	-	-	-	-
F	Cynoglossum officinale	-	-	3	-	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	-	-	2	-	-	-	2	-	.01
F	Draba spp. (a)	-	-	_a -	_b 59	-	-	-	23	-	.26
F	Epilobium brachycarpum (a)	_b 24	_a -	_a 4	_a 11	13	-	2	4	.01	.12
F	Erigeron caespitosus	5	3	-	-	2	1	-	-	-	-
F	Erodium cicutarium (a)	_b 18	_a -	_a -	_c 79	7	-	-	32	-	1.77
F	Euphorbia spp.	-	-	3	1	-	-	1	1	.00	.00
F	Gilia spp. (a)	-	-	-	5	-	-	-	2	-	.03
F	Helianthus annuus (a)	-	6	-	7	-	3	-	4	-	.02
F	Heterotheca villosa	40	46	38	38	20	19	16	20	3.22	3.36
F	Holosteum umbellatum (a)	-	-	-	18	-	-	-	8	-	.41
F	Isatis tinctoria	_a -	_a -	_b 9	_c 31	-	-	6	16	.31	1.13
F	Lactuca serriola	_a -	_b 28	_a 2	_a -	-	14	1	-	.00	-
F	Linaria dalmatica	_a -	_a -	_a 1	_b 6	-	-	1	3	.15	.36
F	Machaeranthera spp	-	-	1	-	-	-	1	-	.00	-

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'85	'90	'96	'01	'85	'90	'96	'01	'96	'01
F	Phlox longifolia	-	-	-	4	-	-	-	2	-	.01
F	Polygonum douglasii (a)	-	-	_b 28	_a -	-	-	13	-	.14	-
F	Portulaca oleracea	-	3	-	-	-	1	-	-	-	-
F	Salsola iberica (a)	-	8	-	2	-	4	-	1	-	.03
F	Tragopogon dubius	_a -	_a 1	_b 17	_a 2	-	1	9	1	.17	.06
F	Unknown forb-perennial	3	-	-	-	1	-	-	-	-	-
F	Verbascum blattaria	-	-	2	-	-	-	1	-	.00	-
Total for Annual Forbs		42	20	61	191	20	10	27	79	0.26	2.74
Total for Perennial Forbs		171	102	98	155	73	46	47	81	4.52	5.72
Total for Forbs		213	122	159	346	93	56	74	160	4.79	8.46

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 05 , Study no: 8

T y p e	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	Artemisia tridentata vaseyana	25	27	2.73	5.09
B	Gutierrezia sarothrae	8	2	.06	-
B	Opuntia spp.	2	2	-	-
B	Purshia tridentata	27	36	14.06	16.55
Total for Browse		62	67	16.86	21.65

BASIC COVER --

Herd unit 05 , Study no: 8

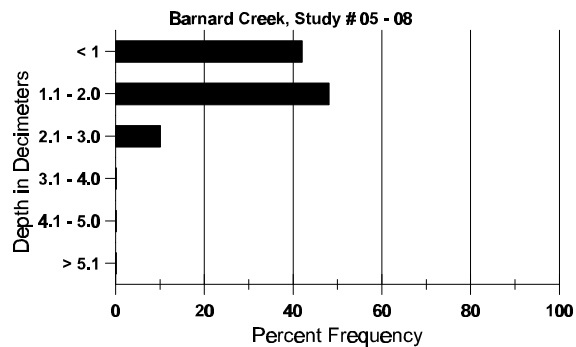
Cover Type	Nested Frequency		Average Cover %			
	'96	'01	'85	'90	'96	'01
Vegetation	393	382	7.25	4.75	55.25	60.27
Rock	180	157	5.00	6.50	5.85	5.56
Pavement	137	179	12.50	13.25	3.92	4.43
Litter	394	374	38.00	61.25	55.74	48.18
Cryptogams	22	7	0	0	.12	.06
Bare Ground	52	137	37.25	14.25	.56	6.14

SOIL ANALYSIS DATA --

Herd Unit 05, Study no: 08, Barnard Creek

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
33.5	53.0 (18.1)	7.0	60.9	19.1	20.0	1.1	5.7	118.4	.3

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 05 , Study no: 8

Type	Quadrat Frequency	
	'96	'01
Deer	20	19
Elk	-	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'01	'01
600	46 (114)
61	5 (12)

BROWSE CHARACTERISTICS --

Herd unit 05 , Study no: 8

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	85	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	90	7	-	-	-	-	-	-	-	-	7	-	-	-	466		7	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	85	4	12	-	-	-	-	-	-	-	15	-	1	-	1066	26 40	16	
	90	1	1	-	-	-	-	-	-	-	2	-	-	-	133	13 22	2	
	96	21	4	-	2	-	-	-	-	-	27	-	-	-	540	19 35	27	
	01	29	-	-	-	-	-	-	-	-	29	-	-	-	580	27 40	29	
D	85	-	1	2	-	-	-	-	-	-	2	-	1	-	200		3	
	90	1	2	-	1	-	-	-	-	-	4	-	-	-	266		4	
	96	4	2	-	-	-	-	-	-	-	5	-	-	1	120		6	
	01	9	-	-	-	-	-	-	-	-	8	-	-	1	180		9	
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	440		22	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	500		25	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		65%			10%			10%			-35%							
'90		23%			00%			00%			-21%							
'96		18%			00%			03%			+13%							
'01		00%			00%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	1332	Dec:	15%			
												'90	865		31%			
												'96	680		18%			
												'01	780		23%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	7	-	-	-	-	-	-	-	-	7	-	-	-	140	13	19	7
	01	4	-	-	-	-	-	-	-	-	4	-	-	-	80	11	14	4
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%			-60%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	0	Dec:	-			
												'90	0		-			
												'96	200		-			
												'01	80		-			
Opuntia spp.																		
M	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66	7	17	1
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	12	2
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40	10	17	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%			+ 0%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	66	Dec:	-			
												'90	0		-			
												'96	40		-			
												'01	40		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	1	-	-	-	-	-	-	-	-	-	1	-	-	66		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	85	-	-	1	-	-	-	-	-	-	-	1	-	-	66	36	51	
	90	2	3	-	-	-	-	-	-	-	-	5	-	-	333	50	66	
	96	9	20	-	-	-	-	-	-	-	-	29	-	-	580	43	73	
	01	13	33	13	-	-	-	-	-	-	-	58	1	-	1180	40	67	
D	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	1	-	-	-	-	-	-	-	-	1	-	-	20		1	
	01	1	1	-	-	-	-	-	-	-	-	2	-	-	40		2	
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'85			00%			100%			+83%							
		'90			50%			00%			+34%							
		'96			70%			00%			+51%							
		'01			56%			21%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	66	Dec:	0%			
												'90	399		0%			
												'96	600		3%			
												'01	1220		3%			